

## APPENDIX A

### Sequence Comparison — Mouse vs. Human TERT

#### Mouse TERT protein sequence

LOCUS 070372 1122 aa linear ROD 15-JUN-2002  
DEFINITION Telomerase reverse transcriptase (Telomerase catalytic subunit).  
ORGANISM Mus musculus  
AUTHORS Greenberg,R.A., Allsopp,R.C., Chin,L., Morin,G.B. and DePinho,R.A.  
TITLE Expression of mouse telomerase reverse transcriptase during development, differentiation and proliferation  
JOURNAL Oncogene 16 (13), 1723-1730 (1998)

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1 mtraprcpav rsllrsryre vwplatfvrr lgepegrrlvq pgdpkiyrtl vaqclvcmh  
61 gsqppppadls fhqvsslkel varvvrclce rnernvlaflg fellneargg ppmftssvr  
121 sylpntviet lrvsgawmll lsrvgddllv yllahcalyl lvppscayqv cgsplyqica  
181 ttdiwpvs sa syrptrpvgr nftnlrlflqq iksssrqea kplalpsrgt krhislsts  
241 vpsakkarcy pvrveegeh rqvlpptsgk swvparsp evptaekdls skgkvsds  
301 sgsvcckhkp sstsllsppr qnafqlrpfi etrhflysrg dgqerlpsf llsnlqpnlt  
361 garrlveiif lgsrprtsgp lcrthrllsrr ywqmrplfqq llyvnaecqy vrllrshcrf  
421 rtanqqvtda lntspphlmld llrlhsspwq vygflraclc kvvsaslwgt rhnerrffkn  
481 lkkfislgky gklsllqelmw kmkvedchwl rsspgkdrvaaehrlre i latflfwlmd  
541 tyvvqllrsf fyitestfqk nrlffyriksv wsklqsigvr qhlervrlre lsqeevrh  
601 dtwlampicr lrfipkpngl rpiivnmsysm gtralgrkq aqhftqrklt lfsmlnyert  
661 khphlmgs sv lgmnndiyrtw rafvrlrvral dqtprmyfvk advtgaydai pgqklvevva  
721 nmirhsesty cirqyavvrr dsqgqvhsf rrqvttsdl qpymgqflkh lqdsdasalr  
781 nsvvieqsis mnesssslf fd ffhlhflrhsv vkgdrcytq cqgipqgssl stllcslcfg  
841 dmenkfaev qrdglllrfv ddfllytphl dqaktflstl vhgvpeygc inlqktv  
901 pvepgtllgga apyqlpahcl fpwcgllldt qtlevfc dys gyaqtsikts ltfqsvfkag  
961 ktmrnkllsv lrlkchglfl dlqvnsllqtv ciniyki l qayrfhacvi qlpfqrvrk  
1021 nltfflgiis sqasccyail kvknpqmtlk asgsfpppea hwlcqyqafll klaahsvi  
1081 cllgplrtaq kllcrkipea tmtlkaaad palstdfqti 1d
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#### Human TERT protein sequence

LOCUS 014746 1132 aa linear PRI 15-JUN-2002  
DEFINITION Telomerase reverse transcriptase (Telomerase catalytic subunit)  
ORGANISM Homo sapiens  
AUTHORS Nakamura,T.M., Morin,G.B., Chapman,K.B., Weinrich,S.L.,  
Andrews,W.H., Lingner,J., Harley,C.B. and Cech,T.R.  
TITLE Telomerase catalytic subunit homologs from fission yeast and human  
JOURNAL Science 277 (5328), 955-959 (1997)

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1 mpraprcrav rsllrshyre vplatfvrr lgpqgwrlvq rgdpaafral vaqclvcvpw  
61 darpppaaps frqvsclkel varvvrclce rgaknvlafg falldgargg ppeafttsvr  
121 sylpntvtda lrgsgawgll lrrvgddlv hilarcalfv lvapscayqv cgpplyqlga  
181 atqarpppha sgprrrlge rawnhsvre a gpvlglpapg arrrggsasr slplpkprrr  
241 gaapepertp vgqgswhapg rtrgpdrgf cvvpsparpae eatslegals gtrhshpsvg  
301 rqhhagppst srpprpwdtp cppyvaetkh flyssgdkeq lrpstflssl rpsltgarrl  
361 vetiflgsrp wmpgtprrlp rlpqrywqmr pfllellgnh aqcpygvl1k thcplraavt  
421 paagvcarek pqgsvaaape edtdprrlvq lrrqhsspwq v ygfvrac1r rlvppglwgs  
481 rhnerrflrn tkkfls lgkh aklsllqeltw kmsvrdcawl rrsppgvgcyp aaehrlreei  
541 lakflhwlms vyvvellrsf fyvtetfqk nrlffyriksv wsklqsigir qhlkrvqlre  
601 lseaevrqhr earpalltsr lrfipkpdgl rpi vnmmyv gartfrrekr aerltsrvka  
661 lfsvlnyera rrpqllgasv l glddi raw rtfvrlrvraq dpppelyfvk vdvtgaydti  
721 pqdrltevia siikpqtyc vrryavvqka a hghv rkafk shvstltdlq pymrqfvahl  
781 qetsplrdav v ieqssslne assglfdvfl rfmchhavri rgksyvqcqg ipqgsilstl  
841 lcslycygdme nklfagirrd glllrlvddf llvtpchltha ktflrltvrg vpeygcvvnl  
901 rktvvnfpv dealggtafv qmpahglfpw cglldtrtl evqsdysya rtsirasltf  
961 nrgfkagrn m rrk1fgvrl kchs1f1d1q vns1qtvctn i yk1llqay rfhacv1qlp  
1021 fhqqvwnkpt fflrvsida slcysilkak nagmslgakg aaglpseav qwlchqafll  
1081 k1trhrvtyv pl1gslrtaq tq1srk1pgt tltaleaaan palpsdfkti 1d
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## Sequence Comparison

Performed at the following website:  
<http://www.ncbi.nlm.nih.gov/blast/bl2seq/bl2.html>

Score = 1340 bits (3468), Expect = 0.0  
Identities = 715/1146 (62%), Positives = 839/1146 (72%), Gaps = 38/1146 (3%)



mouse: 1	MTRAPRCPAVRSLRLRSRYREVWPLATFVRRLGPEGRRLVQPGDPKIYRTLVAQCLVCMHW	60
	M RAPRC AVRSLRLS YREV PLATFVRRLG+P G RLVQ GDP +R LVAQCLVC+ W	
human: 1	MPRAPRCRAVRSLRLRSHYREVLPLATFVRRLGPGQWRLVQRGDPAAFRALVAQCLVCVPW	60
mouse: 61	GSQPPPAPADLSFHQVSSLKELVARVVRQLCERNERNVLAFGFELLNEARGGPPMAFTSSVR	120
	++PPPA SF QVS LKELVARV+QRLCER +NVLAFGF LL+ ARGGPP AFT+SVR	
human: 61	DARPPPAAPSFQRQVSCLKELVARVLQRLCERGAKNVLAFGFALLDGARGGPPEAFTTSVR	120
mouse: 121	SYLPNTVIETLRVSGAWMLLSRVGDDLLVYLLAHCALYLLVPPSCAYQVCGSPLYQICA	180
	SYLPNTV + LR SGAW LLL RVGDD+LV+LLA CAL++LV PSCAYQVCV PLYQ+ A	
human: 121	SYLPNTVTDALRGSGAWGLLRRVGDOVLVHLLARCALFVLVAPSCAYQVCGPPLYQLGA	180
mouse: 181	TTDIWPSVSASYRPRTRPVGRNFTNLRFQQIKSSSRQEAQPKPLALPSRGTKRHLSTSTS	240
	T P AS P R +G ++ + S +EA PL LP+ G +R S S	
human: 181	ATQARPPPHAS-GPRRRLG-----CERAWNHSVREAGVPLGLPAPGARRRGGSASRS	231
mouse: 241	VPSAKKARCYPVPRVEEGPHRQVLPTPSGKSWVPSPAR---SPEVPTAEKDLSKGKVS	296
	+P K+ R P E P Q G++ PS SP P AE+ S +G +S	
human: 232	LPLPKRPRRGAAPEPERTPVGQGSWAHPGRTRGPDRCVFCVSPARP-AEEATSLEGALS	290
mouse: 297	DLSLSG-SVCCHKPSSTSLLSPPRQNAFQLRP-FIETRHFLYSRGDGQERLNPSFLSN	354
	S SV +H S PPR P + ET+HFLYS GD +E+L PSFLLS+	
human: 291	GTRHSHPSVGRQHHAGPPSTSRRPPWDTPCPPVYAEKHFYSSGD-KEQLRPSFLSS	349
mouse: 355	LQPNLTGARRLVEIIFLGSRPRPTSGPLCRTHRLSRRYQMRPLFQQLLVNHAECQYVRL	414
	L+P+LTGARRLVE IFLGSRP G R RL +RYQMRPLF +LL NHA+C Y LL	
human: 350	LRPSLTGARRLVEIIFLGSRPRWMPGTPRRLPRLPQRYQMRPLFLELLGNHAQCPYGVLL	409
mouse: 415	RSHCRFRTA-----NQQVTDALNTSPPHLMDDLRLHSSPWQVYGFRACL	459
	++HC R A + + +T P L+ LLR HSSPWQVYGF+RACL	
human: 410	KTHCPLRAAVTPAAGVCAREKPQGSVAAPEEEEDTPRRLVQLLRQHSSPWQVYGFVRACL	469
mouse: 460	CKVVSASLWGTRHNERRFFKNLKKFISLGKYGKLSLQELMWKMVEDCHWLSSPGKDRV	519
	++V LWG+RHNERRF +N KKFIISLGK+ KLSLQEL WKM V DC WLR SPG V	
human: 470	RRLVPPGLWGSRHNERFLRNTKKFISLGKHAKLQLQELTWKMSVRDCAWLRRSPGVGCV	529
mouse: 520	PAAEHRLRERILATFLFWLMDTYVVQLLRSFFYITESTFQKNRLFFYRKSWSKLQSIGV	579
	PAAEHRLRE ILA FL WLM YVV+LLRSFFY+TE+TFQKNRLFFYRKSWSKLQSIG+	
human: 530	PAAEHRLREEILAKFLHWLMSVYVVELLRSFFYVTETTFQKNRLFFYRKSWSKLQSIGI	589
mouse: 580	RQHLERVRLRELSQEEVRHHQDTWLAMPICRLRFIPKPNGLRPIVNMSYSMGTALGRRK	639
	RQHL+RV+LRELS+ EVR H++ A+ RLRFIPKP+GLRPIVN M Y +G R R K	
human: 590	RQHLKRVQLRELSEAEVRQHREARPALLTSRLRFIPKPDGLRPIVNMDYVVGARTFRREK	649

mouse: 640 QAQHFTQRLKTLFSMLNYERTKPHLGMSSVLGMNDIYRTWRAFVLVRVRA LDQTPRMYFV 699  
+A+ T R+K LFS+LNYER + P L+G+SVLG++DI+R WR FVLRVRA D P +YFV  
human: 650 RAERLTSRVKALFSVLNYERARRPGLLGASVLGLDDIHRAWRTFVLRVRA QDPPELYFV 709

mouse: 700 KADVTGAYDAIPQGKLVEVVANMIRHSESTYCIRQYAVVRRDSQGVHKSFRQVTTLS 759  
K DVTGAYD IPQ +L EV+A++I+ ++TYC+R+YAVV++ + G V K+F+ V+TL+D  
human: 710 KVDVTGAYDTIPQDRLTEVIASIICK-PQNTYCVRRYAVVQKAAGHGVRAFKSHVSTLTD 768

mouse: 760 LQPYMGQFLKHLQDSDALRNSVIEQSISSMNESSSLFDFFLHFLRHSVVKIGDRCYT 819  
LQPYMG QF+ HLQ++ S LR++VVIEQS S+NE+SS LFD FL F+ H V+I + Y  
human: 769 LQPYMRQFV AHLQET--SPLRDAVVIEQSSSLNEASSGLFDVFLRFMCHHAVRIRGKSYV 826

mouse: 820 QCQGIPQGSSLSTLLCSCFGDMENKLFAEVQRDGLLLRFVDDFLLVTPHLDQAKTFLST 879  
QCQGIPQGS LSTLLCSC+GDMENKLFA ++RDGLLLR VDDFLLVTPHL AKTFL T  
human: 827 QCQGIPQGSILSTLLCSCYQDMENKLFA GIRRDGLLLRLVDDFLLVTPHLTHAKTFLRT 886

mouse: 880 LVHGVPEYGC MINLQKTVVNFVPEPGTLGGAAPYQLPAHCLFPWCGLLDTQTLLEVFCDY 939  
LV GPPEYGC++NL+KTVVNFVVE LGG A Q+PAH LFPWCGLLDT+TLEV DY  
human: 887 LVRGVPEYGC VVNLRKTVVNFVVEDEALGGTAFVQMPAHLGFPWCGLLDTRTLLEVQSDY 946

mouse: 940 SGYAQTSIKTSLTQSVFKAGKTMRNKLLSVRLKCHGLFLDLQVNSLQTVCINIYKIFL 999  
S YA+TSI+ SLTF FKAG+ MR KL VRLRKCH LF LQVNSLQTVC NIYKI L  
human: 947 SSYARTSIRASLTFNRGFKAGRNMRRKLFGVRLKCHSLFLDLQVNSLQTVCTNIYKILL 1006

mouse: 1000 LQAYRFHACVIQLPFDQRVRKNLTFFLGISSQASCCYAILKVKNPGMTLKASGS---FP 1056  
LQAYRFHACV+QLPF Q+V KN TFFL +IS AS CY+ILK KN GM+L A G+ P  
human: 1007 LQAYRFHACVLQLPFHQQVWKNPTFFLRVISDTASLCYSILKAKNAGMSLGAKGAAGPLP 1066

mouse: 1057 PEAAHWLCYQAFLLKLAHSVIYKCLLGPLRTAQKLLCRKLPEATMTILKAAADPALSTD 1116  
EA WLC+QAFLKL H V Y LLG LRTAQ L RKLP T+T L+AAA+PAL +D  
human: 1067 SEAVQWLCHQAFLKLTRHRVTVVPLLGSLRTAQQLSRKLPGTTLALEAAANPALPSD 1126

mouse: 1117 FQTILD 1122  
F+TILD  
human: 1127 FKTILD 1132